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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/521,031	01/12/2005	Robert H Murphy	20020001-US	6558
22590	7590	03/17/2009		
BAE SYSTEMS PO BOX 868 NASHUA, NH 03061-0868			EXAMINER NGUYEN, LUONG TRUNG	
			ART UNIT 2622	PAPER NUMBER
			MAIL DATE 03/17/2009	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/521,031

**Applicant(s)**

MURPHY ET AL.

**Examiner**

LUONG T. NGUYEN

**Art Unit**

2622

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 February 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-4, 7-13, 15, 16 and 20-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 7-13, 15, 16, 20-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/19/2009 has been entered.

### *Response to Arguments*

2. Applicant's arguments filed on 2/09/2009 have been fully considered but they are not persuasive.

In re pages 7-8, Applicants argue that the Applicant's disclosure, and the claims as amended, are directed particularly to *thermal* imaging systems and configurations thereof for sensing the thermal emission pattern of an external scene not otherwise illuminated. Thermal imaging systems have unique characteristics and requirements not present in illuminated scenes where *reflected* energy, rather than *thermal emission*, is the basis of the imaging system. Neither Bakhle nor Medina is directed to thermal imaging where the internal radiant flux of the system is orders of magnitude greater than the sensed external scene thermal radiation.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., *thermal* imaging systems and configurations thereof for sensing the *thermal emission pattern* of an

*external scene* not otherwise illuminated) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). In this case, regarding claim 1, the Applicants amended with the recitation “a thermal imaging focal plane array (FPA) having a plurality of pixels sensitive to heat radiation.” The Examiner considers that Bakhle or Medina do disclose this feature. Bakhle discloses that a CMOS image sensor image array is exposed to light from a scene image (figures 1A-1B, column 1, lines 15-25). Medina discloses a flash lamp or laser 21 illuminates object 22 (figure 2, column 3, lines 50-61); in addition, it should be noted that the invention in Medina is designed generate three dimensional images utilizing visible light waves or other wave lengths, such as infrared, ultraviolet, or x-rays with a suitable detector. Additionally, the Medina invention is designed for use with other types of radiation source different from electromagnetic waves, such as ultrasound (column 1, lines 49-58). This disclosure is equivalent to one embodiment of the present invention as Applicants disclose “In one particular embodiment, the external scene radiation includes IR radiation and the imaging system includes an IR sensitive FPA for generating the closed and open state image signals,” paragraph [0016].

Further, noted that the light illuminates the scene image is considered as external scene radiation comprising heat radiation since it is well known in the art that a light source is called as a heat radiation type (see Komatsu et al., US 5,162,943).

In re page 9, Applicants argue that Medina discloses a video-imaging camera system, again not directed to the unique characteristics of thermal emission-based imagery and system.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., *the unique characteristics of thermal emission-based imagery and systems*) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

In re page 10, Applicants argue that Applicant's use of the term "lens" in claims 7 and 20 are intended to refer to the entire lens assembly or lens set, with its shutter being outboard of the complete lens set so that the full influence of the complete lens set is included in the closed state image signal.

In response, it is noted that the features upon which applicant relies (i.e., to the entire lens assembly or lens set, with its shutter being outboard of the complete lens set so that the full influence of the complete lens set is included in the closed state image signal) are not recited in the rejected claims 7 and 20. Instead, claim 7 or claim 20 recites limitation "the shutter has a lens side surface that is located within five millimeters of the front of the lens." The Examiner considers that Sato does teach this feature, Sato teaches the shutter 2 is disposed at a position which is distanced from the imaging-side surface of the lens L2 by 1.97 mm toward the image side (column 4, lines 48-51).

***Claim Objections***

3. Claim 22 is objected to because of the following informalities:

Since claim 17 has been canceled, Claim 22 (line 1), “method of claim 17” should be changed to --method of claim 15--.

Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-4, 8-13, 15-16, 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bakhle et al. (US 6,061,092) in view of Medina US 5,081,530).

Regarding claim 1, Bakhle et al. discloses a thermal imaging system comprising:

a focal plane array (CMOS sensor image array 18, figures 1A-1B, column 1, line 50 – column 2, line 13) having a plurality of pixels sensitive to heat radiation;

a lens (included in digital camera 10, figures 1A-1B) adapted to focus heat radiation from a scene in front of the lens onto the FPA behind the lens (figures 1A-1B, column 1, lines 15-24);

a shutter (shutter 12, figures 1A-1B, column 1, line 50 – column 2, line 13), the shutter having a closed state and an open state wherein the closed state prevents the heat radiation from the scene from entering the system, and allows internal radiant flux of the imaging system to reach detectors of the FPA as a reference image signal and the open state that allows an open

state image signal that includes the heat radiation from the scene and the internal radiant flux of the system to enter the system and reach detectors of the FPA;

a signal processing module (dark image subtraction unit 22, figures 1A-1B, column 1, line 50 – column 2, line 13) operatively coupled to the FPA, and adapted to correct the open state image signal based on the reference image signal.

Bakhle et al. fails to specifically disclose the shutter is located between the lens and the scene in front of the lens. However, Medina teaches a camera, which also discloses a focal plane array (sensor 26, figure 2, column 1, lines 49-58; column 3, lines 54-67) having a plurality of pixels sensitive to heat radiation; Medina discloses the shutter 24 is located between lens 25 and the scene of object 22; and could be placed behind the lens (figure 2, column 3, lines 62-67). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Bakhle et al. by the teaching of Medina in order to focus the radiation light from a scene onto the CMOS sensor image array. It is a design choice to dispose the shutter in front of the lens or behind the lens.

Regarding claim 2, Bakhle et al. discloses a shutter controller (solenoid 14, figures 1A-1B) operatively coupled to the shutter, and adapted to command the shutter to its opened and closed states.

Regarding claim 3, Bakhle et al. discloses a system controller communicatively coupled to the shutter controller and the signal processing module, and adapted to control operation of the imaging system (a system controller is included in digital camera 10 to control operation of

digital camera 10, figures 1A-1B).

Regarding claim 4, Bakhle et al. discloses the system controller is communicatively coupled to a network thereby enabling the imaging system to communicate with other systems also communicatively coupled to the network (Bakhle et al. discloses video camera is coupled to a personal computer through a bus interface, column 2, lines 15-28).

Regarding claim 8, Bakhle et al. discloses wherein for any one session of imaging system operation, each of a plurality of open state image signals are corrected for pixel-to-pixel non-uniformities and offset based on the open and closed state image signal (column 1, line 50 – column 2, line 28).

Regarding claim 9, Bakhle et al. discloses wherein the closed state image signal is periodically generated to account for changes in the imaging system (column 7, lines 19-28).

Regarding claim 10, claim 10 is a method claim of apparatus claim 1; therefore, see examiner's comment regarding claim 1.

Regarding claim 11, Bakhle et al. discloses wherein correcting the open state image signal includes compensating for pixel-to-pixel non-uniformities of the FPA (column 1, line 50 – column 2, line 13).



Regarding claim 12, Bakhle et al. discloses wherein correcting the open state image signal includes compensating for offsets between the opened and closed states of the shutter (column 1, line 50 – column 2, line 13).

Regarding claim 13, Bakhle et al. discloses wherein correcting the open state image signal includes compensating for pixel-to-pixel non-uniformities and offsets between the opened and closed states of the shutter (column 1, line 50 – column 2, line 13).

Regarding claims 15-16, all the limitation of claims 15-16 are included in claim 1; therefore, see examiner's comment regarding claim 1.

Regarding claim 21, see examiner's comment regarding claim 2.

Regarding claim 22, see examiner's comment regarding claim 3.

6. Claims 7 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bakhle et al. (US 6,061,092) in view of Medina US 5,081,530) further in view of Sato (US 6,181,484)

Regarding claims 7 and 20, Bakhle et al. and Medina fail to specifically disclose wherein the shutter has a lens side surface that is located within five millimeters of the front of the lens. However, Sato teaches the shutter 2 is disposed at a position which is distanced from the imaging-side surface of the lens L2 by 1.97 mm toward the image side (column 4, lines 48-51). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention

was made to modify the device in Bakhle et al. and Medina by the teaching of Sato in order to provide a compact camera.

***Conclusion***

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to LUONG T. NGUYEN whose telephone number is (571) 272-7315. The examiner can normally be reached on 7:30AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, DAVID L. OMETZ can be reached on (571) 272-7593. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

